REMARKS

This is in response to the *Non-Final* Office Action of May 12, 2009, where the Examiner has rejected claims 1, 3-12, 14-22, 24-28 and 30-49. By the present amendment, applicant has amended claims 1, 12, 22 and 28. After the present amendment, claims 1, 3-12, 14-22, 24-28 and 30-49 remain pending in the present application. Reconsideration and allowance of outstanding claims 1, 3-12, 14-22, 24-28 and 30-49 in view of the following remarks are requested.

A. Rejection of Claims 1, 3-10, 12, 14-20, 22, 24-26, 28, 30-32 and 34-49 under 35 USC §102(b)

The Examiner has rejected claims 1, 3-10, 12, 14-20, 22, 24-26, 28, 30-32 and 34-49, under 35 USC §102(b), as being anticipated by Kroon (USPN 5,664,055) ("Kroon"). Applicant respectfully disagrees with the Examiner's rejection; however, in order to expedite the prosecution of the present application, applicant has amended independent claims 1, 12, 22 and 28 to further clarify the invention of claims 1, 12, 22 and 28.

For example, by the present amendment, applicant has amended independent claim 1 to recite in part:

> A method of improving synthesized speech quality in a speech coding system including an encoder and a decoder operable in narrowband frequencies and wideband frequencies, said method comprising:
>
> obtaining an input speech signal by said encoder;
>
> coding said input speech signal by said encoder using a Code Excited Linear Prediction (CELP) coder to generate CELP coding parameters for synthesis of said input speech signal;

generating a plurality CELP speech frames by said encoder, each of said plurality CELP speech frames including said CELP coding parameters;

when said encoder is operating in said narrowband frequencies:

transmitting said CELP coding parameters as part of each of said plurality of CELP speech frames;

when said encoder is operating in said wideband frequencies:

classifying each of said plurality CELP speech frames into a plurality of classes, wherein each of said plurality of classes of said input speech signal represents a different degree of periodicity of said input speech signal, and wherein said plurality of classes of said input speech signal include a background noise class, an unvoiced class, a first voiced class, a second voiced class, wherein said first voiced class has a lower degree of periodicity than said second voiced class;

creating a plurality of voicing indexes by said encoder, wherein each of said plurality of voicing indexes specifically designates one of said plurality of classes of said input speech signal; and

transmitting each of said plurality of voicing indexes as part of each of said plurality of CELP speech frames and in addition to said CELP coding parameters, by said encoder to said decoder for specifically designating one of a plurality of classes corresponding to each of said plurality of CELP speech frames, whereby enhancing said synthesis of said input speech signal by said decoder.

Applicant respectfully submits that, as described in the present application, voicing index is used to improve coding in wideband frequencies, since when the speech coder is operating in higher frequencies the speech signal does not remain as harmonic because the probability of having noisy speech signal increases as the frequency increases. Below, please find excerpts from the present application to that effect (page 7, lines 6-20):

> As illustrated in Figure 1, the speech signal is quite harmonic at lower frequencies, but at higher frequencies the speech signal does not remain as harmonic because the probability of having noisy speech signal increases as the frequency increases. For instance, in this illustration the speech signal exhibits traits of becoming noisy at the higher frequencies, e.g., above 5.0 kHz. This noisy signal makes waveform matching at higher frequencies very difficult. Thus, techniques like ABS coding (e.g. CELP) becomes unreliable if high quality speech is desired. For example, in a CELP coder, the synthesizer is designed to match the original speech signal by minimizing the error between the original speech and the synthesized speech. A noisy signal is unpredictable thus making error minimization very difficult.
>
> Given the above problem, embodiments of the present invention use a voicing index which is sent to the decoder, from the encoder, to improve the quality of speech synthesized by an ABS type speech coder, e.g., CELP coder.
>
> The voicing index, which is transmitted by the encoder to the decoder, may represent the periodicity of the voiced speech or the harmonic structure of the signal.

Therefore, applicant has amended independent claims to recite that classification of speech, creation of voicing indexes and transmission of voicing indexes in addition to CELP coding parameters occurs when operating in wideband frequencies, and not when operating in narrowband frequencies. Applicant respectfully submits that Kroon and other cited references fail to disclose, teach or suggest the elements of claims 1, 12, 22 and 28, as amended.

Accordingly, for the reasons stated above, it is respectfully submitted that claim 1, as amended, is patentable over Kroon. In addition, independent claims 12, 22 and 28 include limitations similar to those of claim 1, as amended, and should be allowed for the same reasons stated above. Further, claims 3-10, 14-20, 24-26, 30-32 and 34-49 depend from claims 1, 12, 22 and 28, respectively, and should be allowed at least for the reasons stated above.

B. Rejection of Claims 11, 21, 27 and 33 under 35 USC §103(a)

The Examiner has rejected claims 11, 21, 27 and 33, under 35 USC §103(a), as being unpatentable over Kroon in view of Morii, et al. (PGPUB 2006/0206317) ("Morii").

Applicant respectfully submits that claims 11, 21, 27 and 33 depend from claims 1, 12, 22 and 28, respectively, and should be allowed at least for the reasons stated above.

C. Conclusion

Based on the foregoing reasons, an early Notice of Allowance directed to all claims 1, 3-12, 14-22, 24-28 and 30-49 pending in the present application is respectfully requested.

Respectfully Submitted,
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